

REMARKS/ARGUMENTS

Claims 21-24 are active and drawn to the elected subject matter.

Claim 21 is amended to clarify that the titanium dioxide is deposited in amorphous form and then converted to anatase form as described in the Examples (see, e.g., Example 1 at page 7-8). Thus, the rejection under 112, second paragraph is no longer applicable.

New Claim 24 finds support in the Examples (see, e.g., Table I).

No new matter is added.

Applicants thank Examiner McDonald for the courtesy of meeting with their undersigned representative on November 13, 2009. During this meeting the rejection applied under 35 USC 112, second paragraph was discussed (see above comment and amended claim submitted in this paper) as well as the new Finley (US 2002/0045073) and Honjo (previously cited). A separate rejection is raised against Claim 23 citing both of these references further in view of Krisko (previously cited).

As explained during the meeting, Finley teaches providing a substrate such as glass, (see paragraphs 23 and 24) coated with a photoactive material such as titanium dioxide (see paragraphs 27 and 28), and they include a functional coating (see paragraph 31). Finley also suggests heating the substrate after the coating has been deposited by CVD to anneal or temper the substrate (see paragraph 39). In the rejection, the Examiner relies on Tables 1 and 4 (see the top of page 4 of the Official Action) to allege that high temperatures, e.g., 636° promotes anatase formation (see also the cited Example 56 of Finley).

Table IV of Finley assesses anatase and rutile forms of TiO<sub>2</sub>. ZrO<sub>2</sub> is in the cubic form. However, unlike the characterization of the temperature effects on anatase form relied upon in the rejection, actually the level of anatase form is higher at the lower temperature of 524° compared to higher temperature 636°. Therefore, contrary to the Examiner's conclusion, there is no pattern from Finley's data nor is there any statement in

Finley that contradicts Applicants prior position of unexpected results, particularly in view of Jamison as it specifically relates to titanium dioxide. While it recognized that Honjo is relied upon to teach the higher temperature (higher than Finley), in light of Finley's teachings the combined teachings of these references lead one away, rather than towards, the claimed invention which utilizes temperatures above 630°C as the skilled person would expect a lower anatase formation based on what Finley teaches.

As explained in previous responses, the inventors discovery of achieving crystallization by a single heat treatment while maintaining good photocatalytic activity was not reasonably expected (referencing the Jamieson et al publication again). Indeed, the invention makes it possible to obtain in a simple manner a glazing having 2 properties : self-cleaning for the outside part of the building and low-emissivity or solar control for the inside part of the building. Deposition is made by sputtering on both sides, and is followed by a heat treatment at high temperatures (above 630°C).

Further, as discussed on page 2 of the application, the inventors have succeeded in obtaining high photocatalytic activity and high optical quality by crystallizing the titanium dioxide at the temperatures of conventional glass heat treatments, thereby achieving this crystallization by the single toughening or other heat treatment and avoiding an additional subsequent heating operation at a more moderate temperature.

With respect to new claim 24 which applies the titanium dioxide to a silicon dioxide subcoating it should be noted that the process of Finley is very specific, as it implies a subcoating that enhance the growth of anatase. The specific subcoating is cubic  $ZrO_2$ . See, for example, paragraph [0010]. Indeed, according to Finley, the choice of cubic  $ZrO_2$  yields anatase  $TiO_2$ . Because of this specific subcoating, taught by Finley, that anatase can be obtained even above 600°C, at temperatures where anatase normally converts to rutile as

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explained previously. (see, e.g., the previously submitted article by Jamieson et al(1969) *Mineralogical Notes* 54:14771481 showing (see figure 2, page 1480) that the transition anatase-rutile takes place at 600°C or less).

Claim 24 defines a  $\text{SiO}_2$  subcoating upon which the  $\text{TiO}_2$  is deposited  $\text{SiO}_2$  subcoatings are amorphous, and therefore cannot enhance the formation of anatase  $\text{TiO}_2$  as cubic  $\text{ZrO}_2$  which is taught by Finley. Starting from Finley, the skilled person had no reason to replace cubic  $\text{ZrO}_2$  subcoating by a  $\text{SiO}_2$  subcoating. As the important role of  $\text{ZrO}_2$  in anatase formation is highlighted by Finley, the skilled person would simply not have done so.

With respect to the rejection of Claim 23 citing Krisko (with Finley and Honjo). This rejection is to allege that the features of Claim 23 would have been obvious (see page 5 of the Action). However, as discussed above, Finley and Honjo rather than teaching towards the claims leads one away from the claims and nothing in the art teaches the surprising results obtained by the inventors (see again, e.g., page 8 of the present specification). As Krisko does not remedy these core deficiencies, the claims would not have been obvious in view of the combined teachings of these cited publications.

Withdrawal of both rejections applied under 35 USC 103(a) is requested.

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A Notice of Allowance is requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.  
Norman F. Oblon



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Daniel J. Pereira  
Attorney of Record  
Registration No. 45,518

Customer Number  
**22850**

Tel: (703) 413-3000  
Fax: (703) 413 -2220  
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